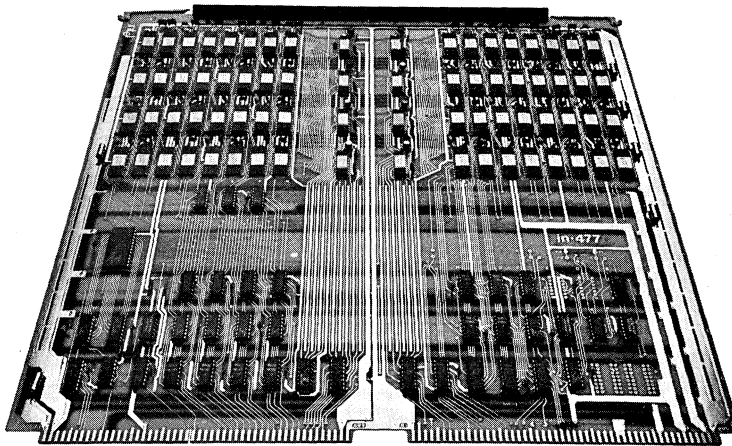


## CRT DISPLAY RANDOM ACCESS MEMORY SYSTEM

The in-477 memory card is designed for storage and retrieval of digital video image data. Each card has a capacity of 256K ( $K = 1024$ ) bits, which will drive a 512 x 512 CRT display. Cards may be operated in parallel to create a gray scale or multi-color displays. The card may be operated in a single bit per cycle serial mode, or a sixteen bit parallel mode. The card contains a sixteen bit parallel-to-serial register with external clocking and loading, to permit a serial bit read out at higher speeds than the normal card cycle time. Refreshing of the data in the n-channel MOS RAM's

is normally achieved by sequential scanning of the memory for display refresh purposes. For special applications, the card can be refreshed externally at a rate of 64 times every 2 millisecc, rather than 256 times every 2 millisecc during the normal display refresh scan. This is accomplished by refreshing one row in all 64 RAM's on the card at once. A clear memory mode allows setting all memory locations to either a one or zero state in a simplified manner, if desired for initialize, reset, erase or other purposes.



### in-477 FEATURES:

- Low cost 2107 4K RAM utilized
- Customer controlled refresh
- Paralleled and serial word and single bit modes of operation
- Allows RANDOM INSTANTANEOUS up dating of data
- Single boards can be used for character/graphic displays
- Multiple boards can be used for Gray scale and color displays
- Designed for use with 512 x 512 CRT MATRIX
- Simplified clear/erase memory mode
- Multiple speeds available by selecting 2107 components

## SPECIFICATIONS

### Capacity:

256K bits, organized as 16K x 16, or 256K x 1

Cycle Time: 850 nanoseconds

Access Time: 600 nanoseconds

Retention Time: Two milliseconds

### Dimensions:

Memory Board 15.0 Inches High  
15.0 Inches Deep  
0.5 Inches—  
Mounting Centers

### Mating Connectors:

Contact Factory

### Operational Mode:

Write Word (Parallel 16 bit data word transfer)  
Read Word (Parallel 16 bit data word transfer)  
Write Bit (Single bit data transfer)  
Read Bit (Single bit data transfer)  
Read Word (Serial 16 bit data word transfer)  
Clear Set

### Interface Characteristics:

Address Input: 18 lines (TTL)

### Data Input/Output:

16 lines for parallel word modes, 1 line for serial word mode, plus 1 line for single bit modes, all open collector, bidirectional lines

### Serial Output (High Speed):

1 line, TTL active pull up/pull down

### Control Input Lines:

Clock enable  
Write enable  
Word/Bit select  
Mode enable  
Card select  
Write time gate  
Clear memory enable  
Shift register load  
Serial shift clock

### D.C. Power Requirement:

	Selected	
Voltage	Current (Max.)	Regulation
+ 5.0V	3.00 Amps	±5%
+ 12.0V	1.50 Amps	±5%
— 5.0V	0.05 Amps	±5%

### Environment:

Temperature: 0°C to +50°C operating ambient  
—40°C to +125°C non-operating  
Relative Humidity: Up to 90% with no condensation  
Altitude: Up to 10,000 feet operating  
Up to 50,000 feet non-operating

### Interface Voltages:

TTL Levels for all inputs and outputs

### Special Options:

Access and cycle times of 280 nanoseconds and 450 nanoseconds respectively can be provided on a custom basis for volume requirements. (Note: these times allow 25 nanoseconds address settling time prior to starting a memory cycle.)